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10/523,636	02/04/2005	Nobuhiko Noto	SUG-183-PCT	5874

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EXAMINER	
BOOKER, VICKI B	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/523,636	Applicant(s) NOTO ET AL.	
	Examiner Vicki B. Booker	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 February 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :04 February 2005 and 10 July 2006.

DETAILED ACTION

This Office Action is in response to the application and pre-amendments filed February 4, 2005. Currently, Claims 1-47 are pending.

Priority

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 12, and 18 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 11, and 27 of U.S. Patent

No. 6,787,383. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

Regarding Claim 1, U.S. Patent No. 6,787,383 discloses a method of fabricating a light-emitting device having a light-emitting layer section configured as having a double heterostructure in which a first conductivity type cladding layer, an active layer, and a second conductivity type cladding layer, all of which being composed of $(Al_xGa_{1-x})_yIn_{1-y}P$ (where, $0 \le x \le 1$, $0 \le y \le 1$), are stacked in this order, and further comprising an ITO transparent electrode layer applying drive voltage for light-emission to the light-emitting layer section on at least either side of the first conductivity type cladding layer and the second conductivity type cladding layer, comprising the steps of: forming a GaAs layer on the light-emitting layer section, forming the ITO transparent electrode layer so as to contact with the GaAs layer; and annealing the stack so as to allow In to diffuse from the ITO transparent electrode layer into the GaAs layer to thereby convert it into a contact layer composed of In-containing GaAs (Claim 27).

Regarding Claim 12, U.S. Patent No. 6,787,383 discloses a light-emitting device having a light-emitting layer section configured as having a double heterostructure in which a first conductivity type cladding layer, an active layer, and a second conductivity type cladding layer, all of which being composed of $(Al_xGa_{1-x})_yIn_{1-y}P$ (where, $0 \le x \le 1$, $0 \le y \le 1$), are stacked in this order; having an ITO transparent electrode layer applying drive voltage for light-emission to the light-emitting layer section on at least either side of the first conductivity type cladding layer and the second conductivity type cladding layer, so as to extract light from the light-emitting layer section through the ITO

transparent electrode layer; and having a contact layer composed of In-containing GaAs, formed between the light-emitting layer section and the ITO transparent electrode layer, as being in contact with the ITO transparent electrode layer, wherein the contact layer is designed to have an In concentration distribution in the thickness-wise direction thereof continuously reducing as becoming more distant away from the ITO transparent electrode layer in the thickness-wise direction (Claim 1).

Regarding Claim 18, U.S. Patent No. 6,787,383 discloses A light-emitting device having a light-emitting layer section composed of a compound semiconductor layer, and an ITO transparent electrode layer applying drive voltage for light-emission to the light-emitting layer section, so as to extract light from the light-emitting layer section through the ITO transparent electrode layer; and having a contact layer composed of In-containing GaAs, formed between the light-emitting layer section and the ITO transparent electrode layer, as being in contact with the ITO transparent electrode layer, wherein the light-emitting layer section is configured as having a double heterostructure in which a first conductivity type cladding layer, an active layer, and a second conductivity type cladding layer are stacked in this order; the contact layer is formed between at least either one of the first conductivity type cladding layer and the second conductivity type cladding layer, and the ITO transparent electrode layer; and, between the contact layer and either cladding layer of the first conductivity type cladding layer and the second conductivity type cladding layer located on the side of formation of the contact layer, an intermediate layer having an intermediate band gap energy between those of the contact layer and the cladding layer is formed (Claims 1 and 11).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-11, 20-36, and 45-47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, line 10-11 contains the term "the stack", which lacks proper antecedent basis.

Claim 1, lines 10-12 contains the phrase "annealing the stack so as to allow In to diffuse from the ITO transparent electrode layer into the GaAs layer to thereby convert it into a contact layer composed of In-containing GaAs", which is indefinite and renders the claim unclear in that it is not clear whether the stack is converted into a contact layer or whether the GaAs layer is converted into a contact layer.

Claims 11, 20, 32-36, and 45-47 each contain the phrase "wherein the intermediate layer and the contact layer are formed over the entire surface of the light-emitting layer section in this order", which is indefinite and renders each claim unclear in that it is not clear whether the intermediate layer and the contact layer are stacked vertically over the entire surface of the light-emitting layer section in this order, or whether the intermediate layer is formed first over part of the surface and then the contact layer is formed second over another part of the surface so that the intermediate

layer and the contact layer are formed over the entire surface of the light-emitting layer section.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-47 are rejected under 35 U.S.C. 102(e) as being anticipated by Ikeda et al. (US 6,787,383; dated 09/07/2004).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding Claim 1, Ikeda et al. show a method of fabricating a light-emitting device having a light-emitting layer section configured as having a double heterostructure in which a first conductivity type cladding layer, an active layer, and a second conductivity type cladding layer, all of which being composed of $(Al_xGa_{1-x})_yIn_{1-y}P$

(where, $0 \leq x \leq 1$, $0 \leq y \leq 1$), are stacked in this order, and further comprising an ITO transparent electrode layer applying drive voltage for light-emission to the light-emitting layer section on at least either side of the first conductivity type cladding layer and the second conductivity type cladding layer (Column 7, paragraph 4 through Column 8, paragraph 1, lines 1-10), comprising the steps of: forming a GaAs layer on the light-emitting layer section (Column 8, paragraph 1, line 11), forming the ITO transparent electrode layer so as to contact with the GaAs layer (Column 8, paragraph 1, lines 14-15); and annealing the stack so as to allow In to diffuse from the ITO transparent electrode layer into the GaAs layer to thereby convert it into a contact layer composed of In-containing GaAs (Column 8, paragraph 1, lines 16-19).

Regarding Claim 2, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 1 as noted above, wherein the annealing is carried out at 600°C to 750°C, both ends inclusive (Column 10, paragraph 1, lines 1-4).

Regarding Claim 3, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 1 as noted above, wherein the annealing is carried out so as to adjust a mean In concentration of the contact layer within a range from 0.1 to 0.6 on the basis of atomic ratio of In to the total concentration of In and Ga (Column 9, paragraph 3, lines 3-6; Column 9, paragraph 4, lines 2-5).

Regarding Claim 4, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 2 as noted above, wherein process time of the annealing is set to 5 seconds to 120 seconds, both ends inclusive (Column 10, paragraph 2, lines 1-2).

Regarding Claim 5, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 1 as noted above, wherein the light-emitting layer section is configured using $(Al_xGa_{1-x})_yIn_{1-y}P$ (where, $0 \leq x \leq 1$, $0.45 \leq y \leq 0.55$) (Column 8, paragraph 3, lines 10-14).

Regarding Claim 6, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 1 as noted above, wherein thickness of the contact layer is adjusted within a range from 0.001 μm to 0.02 μm, both ends inclusive (Column 5, paragraph 3, lines 14-29).

Regarding Claim 7, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 1 as noted above, wherein the annealing is carried out so as to make an In concentration distribution in the thickness-wise direction of the contact layer continuously reduce as becoming more distant away from the ITO transparent electrode layer in the thickness-wise direction (Column 8, paragraph 4, lines 1-5).

Regarding Claim 8, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 7 as noted above, wherein the annealing is carried out so as to adjust C_B/C_A to 0.8 or below, where C_A is In concentration at the boundary position between the contact layer and the ITO transparent electrode layer, and C_B is In concentration at the boundary position on the opposite side. (Column 9, paragraph 2, lines 1-7).

Regarding Claim 9, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 1 as noted above, further comprising a step of forming, between the contact layer and either cladding layer of the first conductivity type cladding

layer and the second conductivity type cladding layer located on the side of formation of the contact layer, an intermediate layer having an intermediate band gap energy between those of the contact layer and the cladding layer (Column 6, paragraph 5, lines 1-7).

Regarding Claim 10, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 9 as noted above, wherein the intermediate layer is formed as containing at least any one of an AlGaAs layer, a GaInP layer and an AlGaInP layer (Column 7, paragraph 3, lines 5-11).

Regarding Claim 34, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 10 as noted above, wherein the intermediate layer and the contact layer are formed over the entire surface of the light-emitting layer section in this order, and the ITO transparent electrode layer is formed so as to cover the entire surface of the contact layer (FIG. 10; Column 7, paragraph 2, lines 8-10).

Regarding Claim 11, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 9 as noted above, wherein the intermediate layer and the contact layer are formed over the entire surface of the light-emitting layer section in this order, and the ITO transparent electrode layer is formed so as to cover the entire surface of the contact layer (FIG. 10; Column 7, paragraph 2, lines 8-10).

Regarding Claim 21, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 2 as noted above, wherein the annealing is carried out so as to adjust a mean In concentration of the contact layer within a range from 0.1 to 0.6 on

the basis of atomic ratio of In to the total concentration of In and Ga Column 9, paragraph 3, lines 3-6; Column 9, paragraph 4, lines 2-5).

Regarding Claim 23, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 21 as noted above, wherein thickness of the contact layer is adjusted within a range from 0.001 μm to 0.02 μm, both ends inclusive (Column 5, paragraph 3, lines 14-29).

Regarding Claim 25, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 21 as noted above, wherein the annealing is carried out so as to make an In concentration distribution in the thickness-wise direction of the contact layer continuously reduce as becoming more distant away from the ITO transparent electrode layer in the thickness-wise direction (Column 8, paragraph 4, lines 1-5).

Regarding Claim 27, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 25 as noted above, wherein the annealing is carried out so as to adjust C_B/C_A to 0.8 or below, where C_A is In concentration at the boundary position between the contact layer and the ITO transparent electrode layer, and C_B is In concentration at the boundary position on the opposite side (Column 9, paragraph 2, lines 1-7).

Regarding Claim 29, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 21 as noted above, further comprising a step of forming, between the contact layer and either cladding layer of the first conductivity type cladding layer and the second conductivity type cladding layer located on the side of formation of the contact layer, an intermediate layer having an intermediate band gap energy

between those of the contact layer and the cladding layer (Column 6, paragraph 5, lines 1-7).

Regarding Claim 31, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 29 as noted above, wherein the intermediate layer is formed as containing at least any one of an AlGaAs layer, a GaInP layer and an AlGaInP layer (Column 7, paragraph 3, lines 5-11).

Regarding Claim 36, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 31 as noted above, wherein the intermediate layer and the contact layer are formed over the entire surface of the light-emitting layer section in this order, and the ITO transparent electrode layer is formed so as to cover the entire surface of the contact layer (FIG. 10; Column 7, paragraph 2, lines 8-10).

Regarding Claim 33, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 29 as noted above, wherein the intermediate layer and the contact layer are formed over the entire surface of the light-emitting layer section in this order, and the ITO transparent electrode layer is formed so as to cover the entire surface of the contact layer (FIG. 10; Column 7, paragraph 2, lines 8-10).

Regarding Claim 22, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 3 as noted above, wherein thickness of the contact layer is adjusted within a range from 0.001 μm to 0.02 μm, both ends inclusive (Column 5, paragraph 3, lines 14-29).

Regarding Claim 24, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 3 as noted above, wherein the annealing is carried out so as

to make an In concentration distribution in the thickness-wise direction of the contact layer continuously reduce as becoming more distant away from the ITO transparent electrode layer in the thickness-wise direction (Column 8, paragraph 4, lines 1-5).

Regarding Claim 26, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 24 as noted above, wherein the annealing is carried out so as to adjust C_B/C_A to 0.8 or below, where C_A is In concentration at the boundary position between the contact layer and the ITO transparent electrode layer, and C_B is In concentration at the boundary position on the opposite side (Column 9, paragraph 2, lines 1-7).

Regarding Claim 28, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 3 as noted above, further comprising a step of forming, between the contact layer and either cladding layer of the first conductivity type cladding layer and the second conductivity type cladding layer located on the side of formation of the contact layer, an intermediate layer having an intermediate band gap energy between those of the contact layer and the cladding layer (Column 6, paragraph 5, lines 1-7).

Regarding Claim 32, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 28 as noted above, wherein the intermediate layer and the contact layer are formed over the entire surface of the light-emitting layer section in this order, and the ITO transparent electrode layer is formed so as to cover the entire surface of the contact layer (FIG. 10; Column 7, paragraph 2, lines 8-10).

Regarding Claim 30, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 28 as noted above, wherein the intermediate layer is formed as containing at least any one of an AlGaAs layer, a GaInP layer and an AlGaInP layer (Column 7, paragraph 3, lines 5-11).

Regarding Claim 35, Ikeda et al. show the method of fabricating a light-emitting device as claimed in Claim 30 as noted above, wherein the intermediate layer and the contact layer are formed over the entire surface of the light-emitting layer section in this order, and the ITO transparent electrode layer is formed so as to cover the entire surface of the contact layer (FIG. 10; Column 7, paragraph 2, lines 8-10).

Regarding Claim 12, Ikeda et al. show a light-emitting device having a light-emitting layer section configured as having a double heterostructure in which a first conductivity type cladding layer, an active layer, and a second conductivity type cladding layer, all of which being composed of $(Al_xGa_{1-x})_yIn_{1-y}P$ (where, $0 \leq x \leq 1$, $0 \leq y \leq 1$), are stacked in this order (Column 6, paragraph 3, lines 1-6); having an ITO transparent electrode layer applying drive voltage for light-emission to the light-emitting layer section on at least either side of the first conductivity type cladding layer and the second conductivity type cladding layer, so as to extract light from the light-emitting layer section through the ITO transparent electrode layer (Column 5, paragraph 1, lines 3-5); and having a contact layer composed of In-containing GaAs, formed between the light-emitting layer section and the ITO transparent electrode layer, as being in contact with the ITO transparent electrode layer, wherein the contact layer is designed to have an In concentration distribution in the thickness-wise direction thereof continuously

reducing as becoming more distant away from the ITO transparent electrode layer in the thickness-wise direction (Column 9, paragraph 1, lines 1-6).

Regarding Claim 13, Ikeda et al. show the light-emitting device as claimed in Claim 12 as noted above, wherein the light-emitting layer section is configured using $(Al_xGa_{1-x})_yIn_{1-y}P$ (where, $0 \leq x \leq 1$, $0.45 \leq y \leq 0.55$) (Column 8, paragraph 3, lines 10-14).

Regarding Claim 37, Ikeda et al. show the light-emitting device as claimed in Claim 13 as noted above, wherein thickness of the contact layer is adjusted within a range from 0.001 µm to 0.02 µm, both ends inclusive (Column 5, paragraph 3, lines 14-29).

Regarding Claim 40, Ikeda et al. show the light-emitting device as claimed in Claim 37 as noted above, wherein a mean In concentration of the contact layer is adjusted within a range from 0.1 to 0.6 on the basis of atomic ratio of In to the total concentration of In and Ga (Column 9, paragraph 3, lines 3-6; Column 9, paragraph 4, lines 2-5).

Regarding Claim 43, Ikeda et al. show the light-emitting device as claimed in Claim 40 as noted above, wherein the contact layer is designed to have C_B/C_A of 0.8 or below, where C_A is In concentration at the boundary position between the contact layer and the ITO transparent electrode layer, and C_B is In concentration at the boundary position on the opposite side (Column 9, paragraph 2, lines 1-7).

Regarding Claim 38, Ikeda et al. show the light-emitting device as claimed in Claim 13 as noted above, wherein a mean In concentration of the contact layer is

adjusted within a range from 0.1 to 0.6 on the basis of atomic ratio of In to the total concentration of In and Ga (Column 9, paragraph 3, lines 3-6; Column 9, paragraph 4, lines 2-5).

Regarding Claim 41, Ikeda et al. show the light-emitting device as claimed in Claim 38 as noted above, wherein the contact layer is designed to have C_B/C_A of 0.8 or below, where C_A is In concentration at the boundary position between the contact layer and the ITO transparent electrode layer, and C_B is In concentration at the boundary position on the opposite side (Column 9, paragraph 2, lines 1-7).

Regarding Claim 14, Ikeda et al. show the light-emitting device as claimed in Claim 12 as noted above, wherein thickness of the contact layer is adjusted within a range from 0.001 μm to 0.02 μm, both ends inclusive (Column 5, paragraph 3, lines 14-29).

Regarding Claim 39, Ikeda et al. show the light-emitting device as claimed in Claim 14 as noted above, wherein a mean In concentration of the contact layer is adjusted within a range from 0.1 to 0.6 on the basis of atomic ratio of In to the total concentration of In and Ga (Column 9, paragraph 3, lines 3-6; Column 9, paragraph 4, lines 2-5).

Regarding Claim 42, Ikeda et al. show the light-emitting device as claimed in Claim 39 as noted above, wherein the contact layer is designed to have C_B/C_A of 0.8 or below, where C_A is In concentration at the boundary position between the contact layer and the ITO transparent electrode layer, and C_B is In concentration at the boundary position on the opposite side (Column 9, paragraph 2, lines 1-7).

Regarding Claim 15, Ikeda et al. show the light-emitting device as claimed in Claim 12 as noted above, wherein a mean In concentration of the contact layer is adjusted within a range from 0.1 to 0.6 on the basis of atomic ratio of In to the total concentration of In and Ga (Column 9, paragraph 3, lines 3-6; Column 9, paragraph 4, lines 2-5).

Regarding Claim 16, Ikeda et al. show the light-emitting device as claimed in Claim 15, wherein the contact layer is designed to have C_B/C_A of 0.8 or below, where C_A is In concentration at the boundary position between the contact layer and the ITO transparent electrode layer, and C_B is In concentration at the boundary position on the opposite side (Column 9, paragraph 2, lines 1-7).

Regarding Claim 17, Ikeda et al. show the light-emitting device as claimed in Claims 12 as noted above, further comprising, between the contact layer and either cladding layer of the first conductivity type cladding layer and the second conductivity type cladding layer located on the side of formation of the contact layer, an intermediate layer having an intermediate band gap energy between those of the contact layer and the cladding layer (Column 6, paragraph 5, lines 1-7).

Regarding Claim 19, Ikeda et al. show the light-emitting device as claimed in Claim 17 as noted above, wherein the intermediate layer is formed as containing at least any one of an AlGaAs layer, a GaInP layer and an AlGaInP layer (Column 7, paragraph 3, lines 5-11).

Regarding Claim 46, Ikeda et al. show the light-emitting device as claimed in Claim 19 as noted above, wherein the intermediate layer and the contact layer are

formed over the entire surface of the light-emitting layer section in this order, and the ITO transparent electrode layer is formed so as to cover the entire surface of the contact layer (FIG. 10; Column 7, paragraph 2, lines 8-10).

Regarding Claim 20, Ikeda et al. show the light-emitting device as claimed in Claim 17 as noted above, wherein the intermediate layer and the contact layer are formed over the entire surface of the light-emitting layer section in this order, and the ITO transparent electrode layer is formed so as to cover the entire surface of the contact layer (FIG. 10; Column 7, paragraph 2, lines 8-10).

Regarding Claim 18, Ikeda et al. show a light-emitting device having a light-emitting layer section composed of a compound semiconductor layer, and an ITO transparent electrode layer applying drive voltage for light-emission to the light-emitting layer section, so as to extract light from the light-emitting layer section through the ITO transparent electrode layer; and having a contact layer composed of In-containing GaAs, formed between the light-emitting layer section and the ITO transparent electrode layer, as being in contact with the ITO transparent electrode layer, wherein the light-emitting layer section is configured as having a double heterostructure in which a first conductivity type cladding layer, an active layer, and a second conductivity type cladding layer are stacked in this order; the contact layer is formed between at least either one of the first conductivity type cladding layer and the second conductivity type cladding layer, and the ITO transparent electrode layer (Column 6, paragraph 3, lines 1-6; Column 5, paragraph 1, lines 3-5); and, between the contact layer and either cladding layer of the first conductivity type cladding layer and the second conductivity type

cladding layer located on the side of formation of the contact layer, an intermediate layer having an intermediate band gap energy between those of the contact layer and the cladding layer is formed (Column 6, paragraph 5, lines 1-7).

Regarding Claim 44, Ikeda et al. show the light-emitting device as claimed in Claim 18 as noted above, wherein the intermediate layer is formed as containing at least any one of an AlGaAs layer, a GaInP layer and an AlGaInP layer (Column 7, paragraph 3, lines 5-11).

Regarding Claim 47, Ikeda et al. show the light-emitting device as claimed in Claim 44 as noted above, wherein the intermediate layer and the contact layer are formed over the entire surface of the light-emitting layer section in this order, and the ITO transparent electrode layer is formed so as to cover the entire surface of the contact layer (FIG. 10; Column 7, paragraph 2, lines 8-10).

Regarding Claim 45, Ikeda et al. show the light-emitting device as claimed in Claim 18 as noted above, wherein the intermediate layer and the contact layer are formed over the entire surface of the light-emitting layer section in this order, and the ITO transparent electrode layer is formed so as to cover the entire surface of the contact layer (FIG. 10; Column 7, paragraph 2, lines 8-10).

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vicki B. Booker whose telephone number is 571-270-1565. The examiner can normally be reached Monday through Thursday 9:30am to 6pm E.S.T.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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